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ABSTRACT

The second of an expected series of reports on studies designed to analyze the effects of the installation of a curriculum system in a school district upon the curriculum attitudes and self-perceptions of teachers in that district is presented. The system of curriculum engineering involves all school district personnel in curriculum planning and implementation. A curriculum system is a system for decision-making and action. Curriculum planning refers to all activities utilized in producing a new or changed curriculum. Curriculum implementation involves developing teaching strategies. Data was collected prior to the installation of the curriculum system in a school district in 1970, through the use of four instruments: Curriculum Attitude Inventory, Teacher Opinion Inventory, Teacher Self-Analysis Inventory, and a sheet for principals to rank teachers on curriculum behaviors. Results are presented in tabular form. (CK)

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A STUDY OF THE EFFECTS OF THE INSTALLATION OF A CURRICULUM ENGINEERING SYSTEM

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I. PROBLEM

This report is the second of an expected series of reports on studies designed to analyze the effects of the installation of a curriculum system in a school district upon the curriculum attitudes and self-perceptions of teachers in that district. The system of curriculum engineering involves the organization of all personnel in the school district to perform two primary curriculum functions. The two primary functions are curriculum planning and curriculum implementation. A third function, that of curriculum evaluation, is woven into the planning and implementing functions. Replanning is considered a continuous aspect of the planning function. Possible dependent variables are pre-dispositional measures of teachers' general attitudes, their attitudes toward participating in a curriculum system, and their perceptions of themselves as participants in the curriculum system; others are measures of actual behaviors of teachers as participants in the curriculum functions. Possible independent variables are personal teacher characteristics, leadership activities, and system procedures and processes. The purpose of the series of studies is to observe the effects of the organizational conditions and events upon the attitudes and behaviors of teachers.

Definition of Terms

Certain key terms must be defined for clarity in communication. In this study, a curriculum refers to a written document that is a product of

curriculum planning. It is intended to be used by teachers as a point of departure for developing their teaching strategies for specific groups of pupils. The present Blue Island Curriculum is subject-centered by grade in design. Principal entries under each subject and grade include: (1) subject matter breakdown into subjects, topics, or units, (2) suggested activities for pupils to perform, and (3) expected outcomes in cognitive, psychomotor, and affective behaviors.

A curriculum system is a system for decision-making and action with respect to curriculum functions which are regarded as a part of the total operations of schooling. The system has three primary functions: (1) to produce a curriculum, (2) to implement the curriculum, and (3) to appraise the effectiveness of the curriculum and the curriculum system. Curriculum engineering consists of the organization and processes necessary to make a curriculum system functional in schools.

Curriculum planning refers to all activities and processes utilized in the production of a new curriculum or change to an extant curriculum.

Curriculum implementation refers to the processes utilized to get teachers to use the curriculum as a point of departure for developing teaching strategies for their unique groups of pupils.

Background Information

After almost a year of discussion and planning, a curriculum system was installed in School District No. 130, Cook County, Blue Island, Illinois at the beginning of the 1970-71 school year. The Blue Island school district is an elementary district in which there are approximately 3850 pupils enrolled, and they are housed in ten school buildings. One of the buildings is a junior high school encompassing grades seven and eight; the remainder are K-6 units. There are seven school principals; two of them have more than one building

under their jurisdictions. In the central office, there are the superintendent, an assistant superintendent, a curriculum director, a business manager, and approximately thirty specialist supervisors. There are 124 teachers distributed among the ten schools. All professional personnel are involved in the curriculum system.

The curriculum system was designed with two purposes in mind. One was to insure that the curriculum would be adequately implemented in all schools and classrooms in the school district, and the other was to bring the district's curriculum under constant surveillance with the end in view of revising it annually wherever it is deemed important to do so. Thus, the curriculum system consists of two major functions: planning and implementing. Appraisal is a constant process during the planning and implementing operations.

All teachers are involved in the functions of curriculum planning and curriculum implementation, but the organization structures for the two functions differ. The function of curriculum implementation takes place in the individual schools under the leadership of the building principals. Teachers develop their teaching strategies using the curriculum as a point of departure. It is the job of the principal to facilitate and improve this process. He, in turn, is accountable to the central office for the effectiveness of the implementation function in his building. For the planning function, teachers are organized into three groups: (1) a curriculum council, (2) nine committees organized horizontally by grade level, and (3) seven committees organized vertically by subject with all grade levels represented. The horizontal committees have the responsibility for reviewing any proposals for curriculum change in terms of the proposed effect upon the total plan for a single grade, particularly the horizontal articulation among

the various school subjects. The vertical committees have the responsibility for reviewing any proposals for curriculum change in terms of the effect of the proposed change upon the vertical, or sequential, articulation of the subject matter in question. The curriculum council acts as the final reviewer of all changes made by the vertical and horizontal committees prior to actual change in the curriculum.

The curriculum system has been operative in Blue Island since the fall of 1970. Major evaluation data gathering efforts were made in the spring of 1970 and again in 1972. In between, descriptive information has been accumulated to show some of the efforts made to make the system work effectively.

II. DESIGN AND PROCEDURES

As I reported in my paper at AERA a year ago, four measures covering teachers' attitudes toward the curriculum and the curriculum system, teachers' professional attitudes, teachers' perceptions of their own behaviors in relation to the curriculum, and principals' assessments of the behaviors of their teachers in relation to the curriculum system were administered in the school district. These data were accumulated prior to the activation of the curriculum system in the spring of 1970; the system was activated in the fall of 1970. To collect the above data, four instruments were used: (1) the Curriculum Attitude Inventory (CAI) (Langenbach, 1969), (2) the Teacher Opinion Inventory (BTOI) (Bowers, 1955), (3) the Teacher Self-Analysis Inventory (TSAI) (Beauchamp, 1970), and (4) a simple sheet for principals to use in ranking their teachers on curriculum behaviors (PRK). The latter was used to generate T-scores. Personal data on teachers were collected with the CAI. The same data were collected from all teachers again in the spring of 1972.

Data from the second administration of the four instruments were tested for reliability, for independence, for normalcy of distribution, and for homogeneity of variance as they were following the first administration with very similar results. Consequently, space will not be utilized here to repeat those results.

Again the assumed null hypothesis with respect to the data from the four measures was multi-dimensional. H_o: There are no differences in teachers' scores on the CAI, the TSAI, the BTOI, or the PRK for the factors among schools, between sexes, between grade level assignment, among levels of teaching experience, between levels of professional preparation, among levels of curriculum system participation, or among past and present participation conditions. To test the hypothesis, the data for each of the four criterion measures were submitted to analysis of variance treatments.

Growth in mean scores between 1970 and 1972 were observed on the CAI, BTOI, and TSAI. To observe more precisely the effect of the system on teachers through time, similar observations were made for only those teachers who were present in the district and assigned to the same school in 1970 and in 1972. To examine the significance of the gain scores, a t-test for correlated measures was used.

Two important events within the curriculum system produced relevant data. Principals were charged with the responsibility to insure the implementation of the curriculum. Procedurally, they held individual conferences with teachers on problems of developing teaching strategies using the curriculum as their primary point of departure, and they followed those conferences with classroom visits. Two brief evaluation scales were developed to be executed following each of these activities. The evaluation scales were designed so that a score could be assigned to each. Both the number of

these activites reported and the mean teacher scores for each school were ranked and correlated with ranked growth in mean scores between 1970 and 1972 on the CAI, BTOI, TSAI, and PRK. Here we were obviously searching for relationships.

All teachers have had opportunity to make recommendations for curriculum change. In process, these are forwarded to the Curriculum Council which, in turn, directs them to the appropriate planning committees. Minutes are kept on all planning sessions by group secretaries and group leaders. The actual changes in the curriculum are observed.

III. RESULTS

The data from the above procedures are quantitatively so large that it would be most imprudent to present tables displaying all of it in this paper. Only the minimum number of tables essential for this discussion are included. Other tabular data are available, however, to anyone who seriously wants them.

Means and standard deviations of the 1972 teachers' scores on the CAI, BTOI, TSAI, and PRK were computed for the factors school assignment, sex, grade level taught, amount of teaching experience, amount of professional preparation, receipt of remuneration for participation in curriculum affairs, present participation conditions, and past participation conditions. Univariate analyses of variance were computed on each of the four criterion measures for these eight factors. The F-ratios from these computations are summarized in Table I. You will note from Table I that significant differences appeared among schools on the BTOI and the TSAI, among levels of teaching experience on the TSAI, among levels of professional preparation

on the PRK, and among circumstances of past conditions of participation in curriculum work on the CAI.

There was considerable shifting of results from the above analysis on the 1972 data as compared with the 1970 data. So far, we are not able to account for these differences, but we suspect the differences may be attributable to familiarity with language and operating procedures.

Table II, III, and IV show the means, standard deviations, and growth in mean scores by school on the CAI, BTOI, and TSAI between 1970 and 1972. The growth for the entire teacher group on the CAI, and TSAI is significantly beyond chance probability. On the TSAI significant growth was evidenced in all schools but one. Responses on the BTOI remained stable.

The 1970 and 1972 data decks on the criterion measures were reduced to those teachers who were employed and located in the same schools at the time both sets of measures were taken. The obvious reason for this action was to observe changes in behaviors of those teachers who had been constantly employed during the entire two-year span. The resulting means, standard deviations, and mean differences on those measures are shown in Tables V, VI, and VII. The application of the t-test for correlated data showed that significant gains were made by the total reduced group on the CAI and the TSAI. On the TSAI, all schools except two registered significant gains. The BTOI remained stable.

Rank correlation coefficients between the number of conference and interview reports submitted by principals and the mean growth scores of teachers by school on the CAI, BTOI, TSAI, and PRK were computed. Rank correlation coefficients between the combined scores given to teachers by principals in their ratings of conferences and interviews and the four criterion measures also were computed. The only high and significant rank

correlation coefficient was that between the number of conference and interview reports submitted by principals and the mean growth scores of teachers on the TSAI (rho = .759).

In terms of the volume of effort exerted within the curriculum system, it is important to note that principals engaged in 375 teacher interviews and classroom visits. Approximately ten half-day workshops were held devoted to curriculum planning. Two new versions of the curriculum have been produced since 1970. A total of 615 changes were made in the 1972-73 curriculum over the 1971-72 one. An inestimable number of small group, or committee, meetings have been held at diverse times and places. Staff meetings have frequently been devoted to discussion of curriculum implementation or planning problems.

IV. DISCUSSION

For discussion purposes, I have included Table VIII showing a comparison of the observed differences on the criterion measures for personal factors for 1970 and 1972. Shifts in differences attributable to the several factors occurred on all except sex. Differences were most consistently noted on the BTOI. We are not able at this time to account for these shifts, but we suspect that teachers have become more acclimated to curriculum language as it is used in communication within the curriculum system and within three of the criterion measures, the BTOI being the exception. We hope further analyses of the data will produce greater insight.

Apparently our most volatile measure is the TSAI. Greater growth in scores was exhibited on that measure than any other. Here, more than in any other case, we suspect the aforementioned influence of language familiarity.

In our next effort, more emphasis will be placed upon teacher and leadership behaviors, and greater attention will be paid to the character of changes made in the curriculum. In the latter connection, we are in the process of developing procedures for analyzing curriculum content change in light of the quality of advice that teachers who plan the curriculum give to themselves for their own use in developing teaching strategies.

This paper was presented at the Annual Meeting of the American Educational Research Association, New Orleans, February, 1973.

APPENDIX

TABLE I. SUMMARY RESULTS OF ANALYSIS OF VARIANCE OF 1972 TEACHERS' SCORES ON FOUR CRITERION MEASURES FOR EIGHT FACTORS

TABLE II. MEANS, STANDARD DEVIATIONS, AND MEAN DIFFERENCES ON THE CAI FOR 1970 AND 1972

TABLE III. MEANS, STANDARD DEVIATIONS, AND MEAN DIFFERENCES ON THE TSAI FOR 1970 AND 1972

TABLE IV. MEANS, STANDARD DEVIATIONS, AND MEAN DIFFERENCES ON THE BTOI FOR 1970 AND 1972

TABLE V. MEANS, STANDARD DEVIATIONS, AND MEAN DIFFERENCES FOR REDUCED GROUP ON THE CAI FOR 1970 AND 1972

TABLE VI. MEANS, STANDARD DEVIATIONS, AND MEAN DIFFERENCES FOR REDUCED GROUP ON THE BTOI FOR 1970 AND 1972

TABLE VII. MEANS, STANDARD DEVIATIONS, AND MEAN DIFFERENCES FOR REDUCED GROUP ON THE TSAI FOR 1970 AND 1972

TABLE VIII. SUMMARY OF OBSERVED DIFFERENCES ON CRITERION MEASURES FOR PERSONAL FACTORS FOR 1970 AND 1972

TABLE I

SUMMARY RESULTS OF ANALYSIS OF VARIANCE OF 1972
TEACHERS' SCORES ON FOUR CRITERION MEASURES FOR EIGHT FACTORS

F - ratios

	Criterion			
Factor	CAI	BTOI	TSAI	PRK
School (df6,125)	1.54	2.71*	3.98**	0.00
Sex (1,130)	0.44	0.50	0.01	0.76
Grade level (1,30)	1.39	0.38	1.61	0.00
Teaching experience (2,129)	0.41	1.74	6.54**	0.44
Professional preparation (1,130)	0.87	0.89	0.85	4.33*
Remuneration (2,129)	0.38	1.55	2.39	1.04
Present Conditions (3,128)	1.87	0.74	2.14	1.99
Past Conditions (3,128)	2.73*	0.59	1.10	0.30

*$p < 0.05$
**$p < 0.01$

TABLE II

MEANS, STANDARD DEVIATIONS AND MEAN DIFFERENCES ON THE CAI FOR 1970 AND 1972

	CAI 1970			CAI 1972			M_D
School	N_1	M_1	SD_1	N_2	M_2	SD_2	M_2-M_1
01	30	191.6	19.2	34	194.088	18.118	3.4
02	10	188.9	12.1	9	194.778	7.612	5.9
03	24	184.3	15.4	23	191.783	17.980	7.5
04	22	181.5	16.2	23	186.565	18.070	5.0
05	12	196.2	15.1	14	201.286	13.442	5.1
06	14	177.2	11.0	18	186.389	17.301	9.2
07	12	176.0	20.1	12	190.833	17.888	14.8
Total	124	185.54	17.22	131	191.857	17.175	6.321**

**p< 0.01

TABLE III

MEANS, STANDARD DEVIATIONS AND MEAN DIFFERENCES ON THE TSAI FOR 1970 AND 1972

	TSAI 1970			TSAI 1972			M_D
School	N_1	M_1	SD_1	N_2	M_2	SD_2	M_2-M_1
01	30	118.9	18.7	33	138.727	14.460	19.8**
02	10	127.1	28.8	9	139.556	11.883	12.4
03	24	127.4	17.5	23	151.609	14.917	24.2**
04	22	115.2	15.6	23	142.913	17.645	27.7**
05	12	130.6	12.6	14	153.286	9.482	22.6**
06	14	124.7	13.4	18	137.778	12.666	13.0**
07	12	115.8	13.9	12	137.333	11.665	21.5**
Total	124	122.59	17.01	132	143.046	15.06	20.457**

**p< 0.01

TABLE IV

MEANS, STANDARD DEVIATIONS AND MEAN DIFFERENCES ON THE BTOI FOR 1970 AND 1972

	BTOI 1970			BTOI 1972			M_D
School	N_1	M_1	SD_1	N_2	M_2	SD_2	M_2-M_1
01	30	455.8	45.1	33	470.6	45.3	14.8
02	10	496.3	38.7	9	482.9	58.1	-13.4
03	24	467.1	40.8	22	476.3	36.4	9.2
04	22	489.9	52.8	23	495.2	47.8	5.3
05	12	478.6	46.9	14	488.5	38.1	9.9
06	14	443.5	53.1	18	452.6	37.4	9.1
07	12	469.3	35.0	12	457.0	46.6	7.7
Total	124	469.4	47.4	131	475.2	45.0	5.8

TABLE V

MEANS, STANDARD DEVIATIONS, AND MEAN DIFFERENCES FOR REDUCED GROUP ON THE CAI FOR 1970 AND 1972

	CAI 1970			CAI 1972			M_D
School	N_1	M_1	SD_1	N_2	M_2	SD_2	M_2-M_1
01	30	191.6	19.2	30	193.4	18.9	1.8
02	4	184.0	10.0	4	195.0	10.7	11.0
03	18	185.7	16.9	18	191.4	17.4	5.7
04	13	177.1	17.0	13	189.8	21.3	12.7
05	8	195.9	16.4	8	204.6	15.7	8.7
06	8	177.9	10.3	8	183.7	14.7	5.8
07	8	181.7	20.9	8	197.4	18.0	15.7
Total	89	186.2	18.0	89	193.0	18.1	6.8*

*$p < 0.05$

TABLE VI

MEANS, STANDARD DEVIATIONS, AND MEAN DIFFERENCES FOR REDUCED GROUP ON THE BTOI FOR 1970 AND 1972

	BTOI 1970			BTOI 1972			M_D
School	N_1	M_1	SD_1	N_2	M_2	SD_2	M_2-M_1
01	30	455.8	45.1	30	474.4	42.1	18.6
02	4	499.0	38.0	4	504.2	42.7	5.2
03	18	467.3	44.0	18	467.6	36.5	0.3
04	13	500.1	44.4	13	502.5	44.9	2.4
05	8	491.8	43.6	8	484.9	41.6	-6.9
06	8	449.9	55.7	8	446.0	42.4	-3.9
07	8	467.1	34.6	8	464.2	30.1	-2.9
Total	89	470.2	46.7	89	475.9	42.3	5.7

TABLE VII

MEANS, STANDARD DEVIATIONS, AND MEAN DIFFERENCES FOR REDUCED GROUP ON THE TSAI FOR 1970 AND 1972

	TSAI 1970			TSAI 1972			M_D
School	N_1	M_1	SD_1	N_2	M_2	SD_2	M_2-M_1
01	30	118.9	18.7	30	139.3	14.6	20.4**
02	4	143.0	14.5	4	146.7	7.2	3.7
03	18	126.9	18.2	18	151.4	15.4	24.5**
04	13	114.5	16.9	13	148.0	19.9	33.5**
05	8	134.5	10.4	8	155.1	7.7	20.6**
06	8	126.1	16.1	8	139.2	10.6	13.1
07	8	117.0	14.7	8	140.0	12.5	23.0*
Total	89	122.8	18.0	89	144.8	15.3	22.0**

*p 0.05
**p 0.01

TABLE VIII

SUMMARY OF OBSERVED DIFFERENCES ON CRITERION MEASURES FOR PERSONAL FACTORS FOR 1970 AND 1972

Factor	Year	Differences Observed
School	1970	CAI, BTOI
	1972	TSAI, BTOI
Sex	1970	CAI
	1972	CAI
Grade level	1970	CAI
	1972	none
Teaching experience	1970	BTOI
	1972	TSAI
Professional preparation	1970	BTOI, TSAI, PRK
	1972	PRK
Participation	1970	BTOI
	1972	none
Past conditions	1970	none
	1972	CAI